

~~Hewson with the compliments  
of the author~~

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## AN ADDRESS

BEFORE THE

# DELAWARE COUNTY MEDICAL SOCIETY.

BY

ADDINELL HEWSON, M.D.,

OF PHILADELPHIA.

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ON VARIOUS PURPOSES TO WHICH EARTH MAY BE APPLIED  
IN MEDICINE AND SURGERY.

A N A D D R E S S

DELIVERED BY INVITATION BEFORE THE

DELAWARE COUNTY MEDICAL SOCIETY

ON THURSDAY, SEPTEMBER 3 1874,

BY

ADDINELL HEWSON, M.D.,

SURGEON TO THE PENNSYLVANIA HOSPITAL.

"JUNcta SiVANT."

LINDSAY

PUBLISHED AT THE REQUEST OF THE SOCIETY.

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MEDIA, PA., October 1, 1874.

DR. ADDINELL HEWSON.

DEAR SIR: The undersigned were appointed a Committee by the Delaware County Medical Society to express to you the satisfaction given by your recent instructive Lecture before that body, on your latest appliance of the Earth treatment, and to solicit the same for publication as a valuable contribution to medical literature.

A favorable response will gratify yours, sincerely,

ISAAC N. KERLIN,

LINNÆUS FUSSELL.

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135 S. 15TH STREET, PHILADA., October 3, 1874.

DRS. KERLIN AND FUSSELL,

Committee of the Delaware County Medical Society.

GENTLEMEN: Your favor of the 1st instant is received, and I shall take much pleasure in complying with the request of your Society for the publication of my recent address before it.

I am, with much respect, very truly yours,

ADDINELL HEWSON.



## A D D R E S S.

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GENTLEMEN: When, in 1870, I received, through my much-esteemed friend, Dr. Kerlin, an invitation to address you on a subject which, I may fairly say, I had then just commenced to investigate, namely, "Surgical Dressings with special reference to the use of Earth," I was compelled to decline the honor from the fact that I could not command the leisure, for I was working on the subject—and very heavily too—at the expense of the little time I had for rest from a most active practice in our profession, and I am sure you can all appreciate the force of such a reason.

My work then,—which resulted in the little volume I have published on the subject,\*—although there is not much to show for it, was a severe tax on me and made it prudent for me to avail myself of the occasion of my wife's seeking health abroad in 1872 to go, and to stay away from my ordinary duties for a full year.

Whilst abroad, the temptation was frequently offered me to address members of our profession, as I do you to-day, on this subject. But I stoutly adhered to the determination which I formed when I felt myself compelled to decline your flattering invitation in 1870, and which was, not only, *never* to forget the compliment you had paid me, but to prove my appreciation of it by making a meeting of *your* society the *first* occasion of such an address from me. This part of my resolution I am most happy to be able to carry out to-day.

Furthermore, Delaware County is most emphatically entitled to be the first in which I should so speak from the facts that I

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\* On the Use of Earth in Surgery. With Four Photo-Relief Illustrations.  
By Addinell Hewson, M.D. Philadelphia: Lindsay & Blakiston. 1872.

have not only had from her my most *instructive* cases, but have found in her members of the profession the most zealous supporters in my work. And, again, one of the ideas which I started out to develop I very early found had been conceived more than ten years before by one of Delaware County's most estimable citizens, Minshall Painter.

A letter suggesting the use of earth as a dressing in surgery, which he sent to the steward of our hospital in 1857, was put away at that time by Mr. Malin as a curiosity; coming as it did in the days of the height of water-dressing, and uneasing washings—in the days, if I may be allowed to coin a word for the occasion, of *Palophobia* ( $\pi\gamma\lambda\omega\varsigma$ , *dirt*, or earth properly speaking, and  $\varphi\sigma\beta\omega\varsigma$ , *dread*), for I know of no more foreible way of briefly expressing the state of things at that time, when soap and water were twice as much used as before or since then in the dressings of surgical patients.

Here is a copy of the letter of Mr. Painter, and I must read it to you:

"LIMA P. O., DELAWARE COUNTY, PA.,  
July 29th, 1857.

"W.M. G. MALIN:

"In a few words I wish to bring to the notice of those who have ample opportunity of examining into its value, a suggestion which may or may not be of some importance. I mean the use of the earth to ill-conditioned sores.

"Plants introduce their roots into the soil and it makes the best application to wounds on the more elevated parts of trees. Some animals burrow and pass most of their time in the earth, others roll themselves in mud, and others again seek the earth as a suitable place for repose; indeed it seems well suited to organized nature. The farmer as he trudges along his furrows covered with dust, never doubts its healthfulness, if he does not permit it to remain on his skin too long. The Arab of the desert, performing his religious devotions, for the want of water uses sand with which to rub his body, and which, no doubt, removes the exfoliating skin and exhalations. Offensive smells are sometimes removed from clothing, and even articles of food, by being buried in the soil. Fullers use earth in cleaning their cloth, for which soap is not so well suited in many instances. It is an Eastern custom to use scented clay instead of soap at their toilet, which causes the skin to remain smooth by not affecting the lubricating oil immediately below the surface, which is affected by alkaline soaps. Children that crawl on

earth and play in the dust, and occasionally fill their mouths with it, provided their nurses occasionally clean them, are generally healthy. Instead of soap, the earth is sufficient to remove any exhaled matter from the skin, not only by absorption, but by its scouring property in being removed by water. Some animals occasionally lick or eat earth ; perhaps by their instinct they find it necessary for their health ; indeed, we have heard of savages who eat largely of some varieties of clay, and some families, not over tidy, enjoy good health, while those more scrupulous, do not enjoy the best.

"We presume nature has provided a material very appropriate and cheaper for poultices than the slimy pulaceous poultices made of vegetable matter, and inclined to incipient fermentation when applied to certain parts of the body for any length of time. Earth (soil) has some properties we think which fit it for this use ; putrefying animals emit carbonic gas and ammonia, which damp earth readily absorbs and prevents reabsorption into the system ; the humus poultices may be kept moist by the application of water, while at the affected point ; which cannot be so readily done by slimy poultices ; any active ingredient deemed useful could be added to such poultices as to any other kind. The earth we should select would be the primitive earth from woodland, rejecting the undecomposed matter ; causing it to be suspended in water for a short time, that the heavy and coarse ingredients might subside, and then have the supernatant water decanted, that the finer may subside for use.

"Perhaps the profession might fear being dubbed "mud doctors;" but they are unfit for their profession who object to using the simplest means which nature offers for restoratives ; with such means, the healing art is sufficiently abstruse to tax all their genius.

"If you think my suggestions worthy of trial in hopeless and extreme cases, I should like to know what success attends it. The study of medicine is one branch I have never attended to, and am consequently unacquainted with its *technology*, which will be discovered.

"I am, with respect, etc.,

"MINSHALL PAINTER."

This letter bears on its face the evidence of extensive knowledge and of considerable thought on the subject, but as much as it would profit us to discuss all the points it suggests, the present is not the proper occasion, and I will dismiss it with one or two allusions to one point especially, the damaging effects of the excessive use of soap, referred to by Mr. Painter, and which not only occasioned much merriment at the time of the receipt of his letter, but may even now cause a smile with many. These effects

of soap are however now being extensively recognized. They have been most clearly pointed out by no less an authority than the author of the article "On the Skin," in the Physiology for Practical Use, edited by James Hutton, and published in London at the beginning of the present year.

In England, as at home, I have frequently had occasion to notice not only on the face of the neat and tidy mother and of the maid of advanced years, but on that of the young and budding beauty, the mischief of constantly using this mode of cleansing the skin, which is supposed, very erroneously, by many to be necessary. I refer to that *glistening, smooth* appearance of the face after the use of soap, occasioned by its removing the outer layer of the epithelial scales, and which ultimately results in making the skin of the face *coarse*, and wanting in the softness and freshness of color which are really natural to the English complexion. This never fails to provoke comment from the American traveller abroad, and the question is constantly asked on the Continent, why it is that the English who have by nature so much more beautiful skins than the people on the eastern side of the Channel, so much more frequently have them disfigured and rendered coarse, even in early life.

One whose attention has been directed to this matter in Europe will find *presumptive* evidence not only *there*, against the use of soap in cleansing the skin, and in favor of earth in preserving its softness, similar to what Mr. Painter refers to in the far East, as resulting from the habits of the people, but will find *such* evidence *everywhere* on the Continent, in favor of the *healing* effects of earth, in the cures called *miraculous*, constantly pointed out to one as resulting from the contact of earth, which had either been *blessed* by the Pope, *trodden* on by some saint—our blessed Saviour, his mother, or the like—and which earth, in every instance that I have had the opportunity of examining, is most decidedly of a clayey nature.

But there is not only presumptive evidence of the healing powers of clay to be found in Europe. There are *positive* proofs, recognized by the profession, in the results of the mud-baths used and recommended of late most extensively by physicians in Germany. We have likewise at home such evidences in the "grave

eures" by the Indian "medicine-man," reputed to have been made, not only in the earliest histories of our land, but as being made amongst many of the aborigines of the present day. Nay, the results attained by such men of the Mojavis, with the mud of the Colorado River, is at this moment occasioning the pilgrimage of a host of *desperate* civilized, if not well-educated, sufferers to the country of those Indians in hopes of getting relief. And even the visitors to our mineral springs are using the mud there, and claiming for it astonishing results.

But our palphobic brethren meet all this with a shrug of the shoulder and a declaration, that none of it is material from which any legitimate medical conclusions are to be drawn, or that the most of it is, at least, but the result of ignorance, superstition, or well-marked prejudice. Granted. But are we, in consequence, to shut our eyes to all that it may suggest and justify the wide repute which the profession has long enjoyed of being opposed to every progress in our art? Where would the world be to-day, as to the scourge of Small-pox, if Jenner had been a man of that stamp, and had refused to reflect on the suggestion of the ignorant dairy maid, that the cow-pox was a protection against that disease?

Ignorance and prejudice have had their influence in our profession from time immemorial, but not in the direction of progress and improvement, on the contrary, decidedly *away* from it. It certainly looks like "the pot calling the kettle black," when these men get to talking about ignorance and prejudice, and about fallacy in reasoning. They say, they cannot understand how *dirt*, which they not only had always been taught, but had positively *seen*, to be injurious in surgical dressings, could now be advocated for such purposes, but, was there ever a greater fallacy than this, a more actual confounding of a *specific* with a *generic meaning* of a word. And where is the man amongst them, who by his every utterance against our use of earth, has not convicted himself either of ignorance or of prejudice, and in many instances of both? It has been said that a great objection to the use of earth must be its *uncleanliness*, but there is not any more with it than with your cereates and washes, if carelessness or negligence is to be allowed in either instance. The *idea* of using it is revolting to

some, but why should it be so any more than the use of *hog's fat*, the *dead* tissue of an *animal* considered by most people as *typical* of the utmost filthiness?

The instinct developed in the brute creation, and referred to by Mr. Painter, likewise weakens very materially the idea of *prejudice*; and here I must allude to some, amongst the many facts which have been communicated to me by correspondents in all parts of the world, and which present a remarkable coincidence as to how animals of various kinds had been rapidly cured, either by their own instinct or the interference of man, of severe injuries and nleers, *with clay*, and how they seemed *always to enjoy* the contact of the earth. Some of you, I have no doubt, are familiar with one of these instances, as it occurred in your county, and can readily recall the *delight* and *vivacity* with which your late very worthy citizen, Constant Guillou, related the relief given by the earth to his pet dog, how the animal used to come regularly, after the first application which he received of the earth for a severe burn, to have himself powdered with clay.

Of this instinct of animals in resorting to clay as a means of cure, I have amongst my letters and other communications, three accounts, presenting a most singular coincidence, coming as they did from opposite parts of the globe, for they were from New Jersey, Maryland, and Australia. Each was of an occurrence witnessed in those parts, and was of a dog bitten by a venomous reptile. In each of these instances the dog went, immediately on being injured, and buried the part in some clayey earth, and kept it buried for four or five days. In one instance, the extremes of hunger and thirst could not induce the animal, a noble Newfoundland, to abandon his cure, although every temptation was offered him, by putting food and water near him, but not within his reach unless he left the bed of clay.

I might readily occupy the hour in detailing similar instances, and in so discussing objections to the use of earth, but, gentlemen, I did not come here for that purpose. My purpose was to give you some of my own personal experiences of its value, and to give you an idea of the ground over which that experience has extended.

Your original request was to address you on surgical dressings,

but in making my selections to-day from the vast amount of practical material which I have accumulated in the last five years, I shall not confine myself to that relating to the use of earth as a surgical dressing properly speaking, but shall, on the contrary, knowing that you are all general practitioners, select what will be particularly interesting to you *all*, in your every-day life. I hope that none of you will, however, infer either from the variety of uses to which I have applied the earth, or my zeal and earnestness in studying its effects, that I am prepared to declare it the best of applications, much less an infallible remedy or a panacea.

As most of you are probably aware, my attention was first called to the subject by the well-established deodorizing power of earth, demonstrated by the earth-closets, and I started out to use it for that purpose on offensive ulcerated surfaces, dreading at the time that it would prove an irritant to them, but, to my utter surprise, it seemed *at once* to remove the pains with which the patients were suffering. This not only recalled to my mind my boyhood's experiences in fighting bee's nests, similar to what many of you, I have no doubt, have had with the *soothing* power of mud on the stings of those insects, but also directed my attention to the possibility of its acting as a *sedative* to the pains of superficial inflammations.

So also I early noticed the rapid absorption of the *recent* effusions of lymph, the products of inflammations of loose tissues, or of bruises; then the effects of the contact of earth on troubles of long standing, and of great depth; and thus by careful study, I have been led by the fairest induction to recognize actions of the earth, not only on the skin and on the subcutaneous tissues, but on the deeper parts, and even the various organs of the body.

I wish to call your attention to these in the order in which I have just mentioned them.

And first, as to the action of the earth on the skin and mucous membranes, the effects have always been, evidently, beneficial, both in allaying and in preventing inflammatory tendencies in the promptest manner. Using it as a disinfectant for my hands in the winter months, I found it to protect them from chapping, and to rapidly cure them, where such trouble had ensued from care-

less exposure on leaving a sick-room where I had been compelled to use soap for cleansing them.

Numerous trials of it for those trifling annoyances, the chafings and excoriations about the nose, lips, ears, vulva, prepuce, anus, and folds of the joints, have not only been followed by a speedy *cure*, but by instantaneous relief from the *itching*, and that, too, generally by simply dusting the finely powdered clay on the part. Experience soon taught me here, to forbid any excessive use of the article as tending to the production of crusts which would aggravate the mischief. When this powdering failed, relief was sure to follow from a resort to the clay applied as a paste. But where relief came from the powdering, and crusts happened to form, I have always found it advisable to remove them without the use of water, by simply picking them off, having been fully convinced that the contact of water under those circumstances was an interference with the healing process.

From its producing such prompt soothings in these troubles, I was led to try it for such effects in various eruptive diseases, and here I have been more than satisfied. These effects were not only very apparent in the simplest forms of erythema, of urticaria and rose rash, but in herpes, eczema, erysipelas, scarlet fever, and in fact, in all forms of the exanthemata, characterized as they are by hyperaemia in their early stages. And it was in that stage, essentially, that the benefits of the clay were evident.

I have seen the nettle rash, and the rash from the poison vine, dissipated entirely in four or five hours' time by a covering of clay.

In erysipelas, my experience allows me very positively to claim that its idiopathic form can, in its earliest stages, be cured, with the utmost certainty, in forty-eight hours' time by the complete contact of the earth, and in its traumatic form I always feel confident of a like result, unless there is a complication of abscess or deep-seated suppuration, prior to a resort to its use.

As to my experience with it in scarlet fever, I do not feel bold enough to cite it as sufficient to draw positive conclusions as to so capricious a disease. The facts I have accumulated are, however, very significant. In all the cases which I have seen of that disease in the last five years, I have had it used freely, dusted over

the body, and there has always followed a marked reduction of temperature with positive soothing of the patient, and allaying of delirium and insomnia where they were present. In one instance, to which I will make special reference, the patient, a bright lad of thirteen years, much given to delirium in all febrile disturbances, was alarmingly ill at the very outset of the disease.

On the second day he had a pulse of 125, and a temperature in the axilla of 118°, and such delirium as to require him to be constantly restrained. He had not slept for the forty-eight hours. I then dusted his body and limbs with some powdered clay in a piece of coarse muslin, with the most charming effects. In half an hour he was sound asleep with his pulse at 105, and his temperature 102°.

In this case I am sure you will all admit I had good reason to form a most unfavorable prognosis, prior to the application of the earth, for if my patient was so ill fully twenty-four hours before his disease was at its height, what had I to expect? But he did not have an unfavorable symptom or any excitement of fever after that day. He persisted in constantly dusting himself with the powder, even until his convalescence was complete, always experiencing the most soothing effects.

In this, and in five other instances of scarlet fever, occurring in large families, where the circumstances were such as to prevent the isolation of the case, and to clearly prove the child to have been the only one of the family exposed to contagion from outside, the disease did not spread. This certainly affords strong presumption in favor of an antidotal power of the earth, which is corroborated by the fact that in all other instances of scarlet fever, where this use of earth was faithfully persevered in throughout the stage of desquamation, not one has proved a source of contagion, either directly or indirectly. From the fact that anything which holds out the least possibility of alleviating or mitigating the evils of this horrid disease never fails to attract the attention of the profession, I feel confident that what I now make known will speedily be followed by a most thorough testing of its value.

I have likewise seen blighting effects from the use of earth in small-pox well worthy of the attention of the profession. In one instance I made, with full consent of my patient, an experiment

of contrasting its action with that of the Emp. de Vigo, which will perhaps serve better than any other way, of demonstrating these effects. In it I applied constantly the mercurial plaster on one side of the face, and the clay made with water into a thick paste on the other with the result that my patient's face to this day is *positively* marked on the one (the mercurial) side, and I may fairly say not at all on the other, as there are only one or two pits where the clay did not constantly cover the skin on that side.

Here the earth should also have a fair trial by a resort to its use in the early or hyperæmic stage, otherwise disappointment will be experienced, where results similar to what I have just intimated are anticipated.

In the vesicular and sealy diseases of the skin the best results from the earth are to be looked for in the early stage. In the simplest forms of herpes, if the clay is applied at the first indication of burning and itching, or slight swelling and redness, it will blight the disease in a few hours' time.

In the advanced stages of the sealy forms of skin diseases, I have constantly noticed that the earth would at first relieve the heat or irritation with which the patient may have been suffering, and then afterwards evidently excite an intolerable itching in the part, this latter effect following whether the clay had been applied as a dry powder or as a paste and allowed to dry. Microscopic and other minute examinations have shown these results to be from two distinct actions. The allaying of irritation in a part, which speedily ensues on the contact of the earth, is shown to be associated with a reduction of temperature, tumefaction and hyperæmia, whilst the itching subsequently complained of is as clearly to be traced to a well-marked shrivelling of the epithelial cells, producing in them sharpened points and edges as sources of irritation. These results, any of you who are the victims of corns can demonstrate for yourselves to-night on going to bed if you desire; you will by putting some mud on the corn find the pain in it speedily relieved; but may be disturbed in the night after the clay has become dry by the itching, and when you remove the dressing in the morning, you will find the blush and tumefaction gone, and the sealy portion or core evidently shrivelled.

The itching excited by shrivelling of the epithelial scales sometimes becomes a source of great annoyance, specially at night; it is readily relieved by dampening the dressing by a wet cloth or sponge.

The microscopic student of the effects of the earth on living tissues will, I am confident, have promptly brought to his mind what Prof. Beale has pointed out as occurring in disease, and will readily recognize here just the reverse of what he has demonstrated in the cell changes of diseased action. There is the contraction of the epithelial cells just referred to, and this is generally best seen in the oldest cells, not, however, because they are such, but because they have been nearest to the clay from their superficial position, for where the two have been equally exposed the youngest will be found to be the most acted on, that is, the most contracted by the clay. The student of Beale's work will remember how admirably he demonstrated the difference in the activity of the various portions of a tissue by the use of a weak solution of bichromate of potash, the chromic acid being precipitated, as shown by its color, after the absorption of the solution, by the acid contents of the cells, they having greater affinity for the potash than the chromic acid has. The brilliancy of color being of course proportional to the activity of the cells, is thus found to be greatest in the youngest of them. Such facts sustain the notion advocated by the famous German, Traube, that cell action is carried on by the chemical relations of the parts. That such chemical relations have been and are affected by the contact of the earth is a matter of easy demonstration in many instances, and that the earth acts *chemically* is susceptible of proof in all instances, by the fact that roasting it always destroys its beneficial effects.

I have heretofore spoken of the earth, whose use I am advocating simply as earth, and as clay or clayey earth. I should have perhaps earlier stated more definitely what I recommend. I will therefore state here, that I have found the stiffest yellow clay, that freest of sand or grit, the best for remedial use. It should be dried without roasting, powdered, and sifted through a fine flour-sieve. Its quality and fitness for our purpose are best determined by putting some in the mouth and chewing it; the presence of sand

and of grit and the amount of stiffness can thus be readily ascertained.

What I have just said, and what I said a few minutes before in reference to the remedial action of this earth being of a chemical character, will no doubt suggest to many of you the question put to me once on quite a public occasion, namely, "Why not use the chemical ingredients, and in a chemically pure state?" The answer I then gave, founded as it was on personal experience, will serve me here. The occasion was a *déjeuner* in Paris, where one of England's greatest savans, having heard of some of the remarkable results of the use of earth in our art, asked me, "What I meant by earth?" I promptly said, "Clay, clayey earth." "But what," said he, "is it *chemically*?" "Essentially a *double silicate of alumina*," was my answer. "Why not then use that?" said he. "For the very reason that having tried it, I had found it not to produce the effects which nature's crude article did!" was my reply. This appeared to him, both from his manner and language, as rather absurd.

Subsequently, the conversation which was being carried on by a number of professional men at the table, turned to the cures made by some of the mineral waters of Germany, a subject on which my interrogator had written very considerably, and I then casually asked him what he thought of Bishop's granular preparation of the salts of those waters? He promptly answered me in a very characteristic manner, "Why, sir, you may use Bishop's preparations if you desire, but in doing so, you must not expect to get the same results as are to be obtained from the natural waters!" "Perhaps, then," said I, "you can really appreciate better than you seemed to a few moments ago my position on the use of clay as found in nature!" It was immediately evident from the expressions on the faces of those at the table, that in the opinion of all, I had certainly the advantage in the discussion, and my opponent, after a moment's pause, during which his face became red, said: "Well, I don't know but what you are right; I must really look into the subject for myself."

To return to the effects of clayey earth on the epithelium and corium, I have likewise to refer to them here as beneficial in superficial injuries, whether they were wounds, bruises, or burns,

and in diseased states, such as ozaena, sore throat, gonorrhœa, leucorrhœa, rodent ulcer, epithelial cancer, and keloid degeneration of cicatrix. I have seen it make rapid cures in all of them.

Here are photographs of one of the earliest cases in which I tested it on epithelial cancer. They were published in the "Photographic Review of Medicine and Surgery" for June, 1871. The diseased action, including thereby the induration, involved originally the whole of the lower lip, save just so much at the right angle as I could cover with the pulp of my index finger, and the ulcerated surface was two inches long by one and a quarter at its widest point when I began to use the clay. Its development and growth had followed the use of a pipe. Microscopic examinations made by Dr. Tyson and by myself distinctly demonstrated the character of the ulcer.

Not anticipating any favorable result, it never occurred to me to preserve a picture of this case at the outset of its treatment. Indeed, the idea was suggested only by the marked improvement which had taken place at the end of over three months. Then, the sixty-seventh day, the 3d of January, 1871, the ulcer, as seen by the first picture of the set I show, was more than half cicatrized. Four months later, when the last picture was taken, there was not a trace of the ulcer visible on the outside of the lip; it had then been cicatrized about two weeks. The treatment extended over a period of seven months, and during the whole time the patient never lost a day from his work—that of outdoor labor. No internal treatment was ever added to this local one.

When this patient then left my care as cured, I cautioned him against using the pipe. This injunction I learned afterwards from some of his neighbors he did not long follow, but taking to smoking, the lip soon again became sore, and being ashamed under these circumstances to return to me for advice, he suffered with it until an ulcer of far greater size had formed. For this he sought aid of Dr. Duhring of the skin department of the University Clinic. The Doctor studied the case with care, and has figured it in a subsequent number of the "Photographic Journal," of which he was one of the editors, and in which I had previously published these pictures. His diagnosis confirmed the opinion I

had formed of the case. The fatal result which ensued added to this, and I certainly think that no stronger proof could be asked of the possibility of the earth's power to *heal* such a diseased surface than a fair review of the history of this case. That the disease should have returned is no proof against the healing power of the clay, and this is all I claim for it.

I claimed a few moments ago a power for clay to cure keloid degeneration of cicatricial tissue. Here I will give you a brief summary of a case which has been before published in one of my lectures on the use of earth in burns, at the hospital. The patient was the victim of severe burns from the sport of a child, who threw a lighted match into a coal-oil lamp which she was filling whilst holding it between her knees. The burns of the lower limbs were mostly all of the fourth degree, and were treated by one of my colleagues with the ordinary measures, such as caron oil, sedative poultices, and cerates. When I took charge of the case eight weeks had elapsed since the accident, and most of the ulcerated surfaces were healed, but with such contractions at both knees that the patient could not stand on either limb, and her only way of getting about was either on her buttocks, or on her hands and knees. The cicatricial tissue here was very painful, and of well-defined keloid character. Constant resort to passive motion and mechanical support for over a month by my direction, had no effect in diminishing these symptoms. I had in no other way meddled with the original treatment. At the end of the fifteenth week of her confinement to bed I determined to resort to the clay, but before doing so, I asked Prof. Gross to see the case, without intimating to him my determination to put the clay on. My pretext for getting him to see it was that I knew it would be of special interest to him from the severity of the keloid. He remarked, after examining it with great care, "It is a terrible case, Doctor. What a blessing if *your* earth could do some good there!" My answer was, "We don't know yet all the good it can do." This was on a Wednesday afternoon. The right leg could not then be straightened, or rather extended at the knee beyond 80° from the thigh, and the cicatricial tissue extended from one inch below the vulva to six inches below the knee, and involved at the joint two-thirds of its circumference. The left limb was

not nearly so bad, in fact it could be extended within 20° of the straight line, and I felt that if I could only get the right limb straightened, the patient would be able to move about on her feet. On the following (Thursday) morning I dressed the right limb only with the clay. My purpose in so acting was to demonstrate most effectually by the contrast, the action of the clay on the pains, and the contractions of the two limbs. On Friday, the very next day, the patient expressed herself as relieved of the pain in this limb, and could actually stand up on it. She was of course delighted with my proposal then to dress the left limb also with the earth. You will remember the right was by far the worse limb. The consequence of this second dressing was, that the patient on Saturday morning could readily walk across the room. This was just forty-eight hours after the first application, and to make the demonstration of the result then obtained as surprising as possible to my good friend, Prof. Gross, I directed that my patient should be dressed up with her bonnet and shawl and meet us in the hall of the hospital at noon of that day, when I knew the Professor could join me there, having stopped at his office and asked him to name an hour most convenient for him to see a very interesting case at the hospital. You can all readily appreciate his amazement on entering the hall of the hospital, and being asked if he remembered the patient, a genuine Virginia negress, who, enjoying the joke as much as I did, was grinning from ear to ear, and courtesying in the old-fashioned style. His exclamation was, "Good heavens, you don't mean to say that this is that terrible case of keloid? What have you done for her?" I promptly answered him, and the patient as quickly stated she was materially relieved of the pains. An examination showed that no blistering or cracking had occurred in the keloid, and that it was actually thinner and freer than it was forty-eight hours before. The result of the continuance of the earth dressings for a period of nearly six weeks was the *complete* cure of the trouble, so that the patient then took a situation in the hospital as scullion, which required her to be on her feet all day long. This position she held for over six months, and I had not only the opportunity of frequently examining her and determining the completeness of the cure, but also of showing her to my friends.

Of the effects of the earth on injuries of the superficies I will not make any reference now, as I can at a later period dispose of them more briefly. Before, however, passing to the discussion of the earth's effects when it is applied for deepseated troubles, I must show the pictures I have here of a case of elephantiasis. The case, barring its intrinsic value from its extraordinary character, must be of special interest to you, as it is from your county, and many of you may have seen it at different periods of its history.

The man, a negro farmhand, a native of Virginia, aged twenty-seven, was admitted to the Pennsylvania Hospital, December 1st, 1873, by my colleague, Dr. Morton, for the purpose of resorting to Carnaghan's method—that of tying the femoral artery—for the cure of this disease. Both lower limbs, as can be seen by reference to the first picture, were affected, but the right very much more so than the left. This right limb at the time of the operation measured just above the ankle twenty-two inches in circumference. The disease had been developing in it for fourteen years. It appeared about the same time in the left leg, but was there confined to the deeper tissues, in fact it never developed any ichthyosis in it. Its progress, however, had been such as to make the ankle measure more than the calf of the leg, twelve and a half inches.

The operation of tying the right femoral was performed by Dr. Morton on December 6th, and was, barring an attack of bronchitis which developed itself the next day, followed by no untoward symptom. In fact, it at first promised every success, for the limb very rapidly diminished in size, and even the condition of the skin was much improved. At the end of the third week the ankle measured fourteen and a half inches. Then, however, the collateral circulation showed itself as well established, and the limb began to grow again. An elastic bandage (Esmarch's) was now, January 7th, resorted to, and with decided advantage, for by its pressure the limb was reduced one and a half inches, from fifteen and three-quarters to fourteen and one-quarter inches, in the first forty-eight hours. But no reduction was effected beyond this last measurement, although this form of pressure was continued steadily for four weeks. Then, February 5th, the ichthyotic condition began to grow worse, and the measurements were increased.

I now had had charge of the case for a week, but had made no change whatever in the treatment. The aggravation in the condition of the skin was however such as to tempt me to apply on a portion of it, a strip three inches wide on the front of the leg, a coating of carefully prepared shellac. After it there was some improvement, resulting possibly as much from the fact that the patient could not remove his dressings—a practice he had been pursuing every night for some time before. It was so reduced to the measurement of fourteen and one-quarter inches by the 8th of February, but no improvement as to size occurred afterwards up to the 19th of February.

During all this time, up to February 8th, nothing was being done for the left limb; some improvement, however, had occurred in it from the long rest in the recumbent posture. This improvement had then ceased, and I applied a firm bandage for over twelve days without any benefit. On the 19th of February, the seventy-fifth day after the operation of tying the right femoral, the right leg measured sixteen and one-half inches at the ankle, and the left ten and one-half at the same point, a reduction of five and one-half inches for the right, and one and one-half inches for the left. There had then been no improvement in either for some time, and I felt assured the operation was not going to cure the right, and rest had done all it could for the left.

On this day, February 19th, I applied the clay as a paste, with Seultetns bandage to the left foot and leg, up to the knee, but made no change for the right. On the next day the right was larger, but the left smaller, and this continuing for some days, benefit from the clay was undoubted. Then I resorted to it for both, and in this second picture you can see its effects on the twenty-eighth day after its first use on the left leg. There was then in the left leg not a trace of the disease, and in the right a reduction to ten and three-quarter inches, which was four inches less than it had ever been under the Esmarch bandage. At this stage the patient left the hospital, considering himself well enough to go to work. The case needs no comment from me.

I might here detail to you the histories of rapid cures, of fibroids and other fleshy tumors of superficial parts, including the breast and testes, which I have accomplished by the topical use of

earth, but the time I have occupied warns me to bring this address to a close as soon as possible. I must, however, to do my subject full justice, say something in reference to the earth's healing powers in wounds, and in diseases of deep tissues, especially the latter, for they are the most marvellous of all the results I have seen.

To avoid presuming too much on your patience I will, however, dispose of these in a summary manner.

And, first, of wounds. My experiences with the earth have not only enabled me to heal such, whether produced by accident, for the cures of injuries or disease, in a very rapid manner, but also to attempt to save limbs which I would have formerly cut off as being incurable in any other way. This assertion is sustained by the diminution in the proportion of amputations in my wards, and by the extraordinary successes which have attended my cases of penetrating wounds since I have been using the earth. Thus in the past term of my service, of all the cases of penetrating wounds of the abdomen, six in number, and I cite only those where the omentum protruded and there could be no doubt as to the diagnosis in consequence, the healing occurred directly in all without a sign of inflammation, the patient being up and about, as a rule, within the week, in fact there was but one of the series that remained in the hospital over six days.

Something of the success which has attended my cases, where I have used the earth in wounds of various kinds, I am free to admit is attributable to other details of the dressings. Thus in none of them have I used ligatures. Indeed, I have scrupulously avoided them. Formerly I resorted to acupressure, but now I rely entirely on torsion, and so I get rid of a fertile source of irritation and of delay in the healing. For the purpose of reducing the risks in this direction to a minimum, I have likewise constantly used silver stitches and gauze with collodion, where such were required, to retain the lips of the wound in thorough coaptation. And I never *now* disturb the dressing for the first four or five days, and then merely for the purpose of removing the stitches. Washing the wound after the first dressing is applied I always avoid, if possible.

Bruises and deepseated lacerations have yielded like results.

Indeed, I have seen excessive tumefactions from such sores rapidly removed. I have had both the swelling and the discoloration of badly bruised eyelids dissipated entirely in twenty-four hours by the earth.

But the best, as well as the briefest way in which I can indicate the results attainable by the earth in such injuries, is to state the effects in bad sprains of the ankle and knee. Such injuries I have no doubt you were all taught, as I was, to look on with as much, if not more, dread in reference to the patient's sufferings and confinement than a broken leg. I am also confident that your experience in the past as mine of former days fully sustained such a doctrine. I used to think myself singularly fortunate when I had such a case well in six weeks' time. Remember I am speaking of bad sprains of those joints, and what I mean by *well* is for the patient to be able to use the limb freely, and to need no bandage or support, and to be relieved of all pain or tenderness in the joint. Now since I have been using the clay in such cases, I have had *all* my patients instantly relieved of their pains, and all, with but *one* exception, *well* within two weeks from the time it was first applied. In this exceptional case, the cure was completed on the nineteenth day, and there was in it a complication in the form of rheumatic arthritis.

In deepseated troubles, and in local sufferings from blood poisonings and like constitutional causes I was, quite naturally at first, deterred from using the earth—not only anticipating its failure, but really dreading evil consequences from its producing reperfusion of the morbid action going on in the part. Becoming, however, more and more satisfied with its power of elimination in those actions, I have now ceased entirely to dread any such consequences. Even in *gout* and *inflammatory rheumatism* I do not now hesitate to employ it in conjunction with internal remedies for the destruction of the disease in each instance. Credit, therefore, could be claimed for the earth only in these cases where its use was *speedily* followed by relief of pain and reduction of swelling; and this has been the case, the result being similar in those respects to what I have before stated in reference to corns and bunions.

In bone and periosteal troubles I have seen relief speedily occur

unless there was pent-up pus, and then a free vent had to be given to it.

I have seen the clay also act in the like prompt manner in relieving deep-seated soreness of the flesh from fatigue, from cramps, and from colics, and in rapidly removing the effusions of synovitis, pleurisy, and peritonitis.

The last-named cases tempted me to try it in abdominal tumors, and I could here detail to you, if time permitted, the histories of a number of cases in which it was successfully used, of positive cures by it of undoubted fibroid and fibro-ectytic growths of parts as deep as the broad ligaments and uterus. But I will now, for want of time, only make this reference to them to complete the range over which I have extended my investigations. These last-named results may not, however, be as startling to you as others which I have mentioned, for some of you may have attended Dr. John Potter's lectures at the Almshouse Hospital, Baltimore, as far back as forty years ago, when he used, I am told, to cure cases of *hydrocephalus* by a cap of clay worn constantly on the patient's head, whilst internal treatment was being pursued.

I have now, gentlemen, given you a fair view of the field in which I have been laboring, and of what I consider the range of my subject. I hope, as I said before, that none of you will conclude from this that I wish to make out of the earth a panacea, or claim for it the properties of an infallible remedy. If you may be tempted by my accounts to admit merit in it so far as to try it, I shall be satisfied. A careful examination of its actions will, it seems to me, show them to be essentially of a local anti-inflammatory character, both as to the pain and other conditions, and this must destroy all the idea of absurdity in the very extensive range I have given to my researches.

I will now, if you will spare me more time, exhibit to you the clay as I use it, and, with the assistance of my son, make some demonstrations and explanations of special modes of applying it.

For an account of these demonstrations and as explanatory of my remarks made whilst they were going on, I will offer the following in the form of

## ADDENDA.

The clay exhibited was some stiff yellow clay which had been recently powdered and sifted through a fine flour sieve. And referring to the researches made by Bonssingault on earths taken from various depths in the vicinity of the Rhone in 1822, as to their greed for oxygen, and also to Prof. Way's experiments made in London more recently on the difference between earth taken from the surface, and that from three and a half feet below as to absorbing power of ammonia and other gases, it being double in favor of the deep diggings,\* I stated the advantages I had experienced of late from keeping the earth in bulk rather than in the powdered state, namely, that samples of the same earth always proved more efficient in every way when recently prepared than when they had been kept on hand for any length of time in the powdered state.

The advantages here to the yellow form of clay would seem to be that the iron in it (to which it essentially owes color) is, according to Sanssuir, in a minimum state of oxidation when at certain depths, or protected from the air. The blue color of the potter's clay is according to the same authority due to the large quantity of oxygen which it has condensed, and this fact in connection with my observations that the yellow clay in becoming exhausted or unfit for surgical purposes tends to take that color, suggests a reason for my not getting as satisfactory results from the potter's, and like colors of clay.'

This greed for oxygen and power to deoxidize, and hence to arrest combustion, belongs also in a marked manner to the alumina of clay, and is therefore to be found in all forms of that kind of earth, but not so fully as in that where the iron exists in a low state of oxidation.

Sanssuir's and Austin's experiments on this oxidation, show that it occasions the generation of ammonia where the clay is freely exposed to the air, or in contact with water, the hydrogen and nitrogen which exist in either instance being liberated and allowed to combine with each other.

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\* See my book on the Use of Earth, p. 225 et seq., for fuller details of these and other points alluded to elsewhere concerning the Chemistry of the Earth.

This greed for oxygen which belongs to fresh clay, not only being readily satisfied by pre-exposure to air and to water but also more readily so, such exposures destroy the clay's efficiency as an antiphlogistic application to living tissues, for it will not seek oxygen if it is already satisfied or if it can get that element more readily than by robbing the tissues of it. Hence the advantages I have likewise always experienced from applying it in a dry state, and in such thickness and close contact as to leave but one source (the tissues themselves) from which it can satisfy this greed.

In a burn, ulcer, or wound, I have found it best to surround the part, if possible, by a ring of thick mud, and fill it in with the powder to the depth of half an inch or more, and then cover the whole with a piece of unglazed paper (the blue-colored, as I have stated in my previously published experiences, having proved the best, very probably from its influence on chemical actions), or with some cotton wadding (advocated by Guerin in Paris as a dressing in itself, from its known influence in excluding elements of the air which can be obnoxious to injured and diseased tissues), and then retaining the whole by a well-applied bandage, which is not to be disturbed, as before stated, until there is some necessity.

When it is not possible to apply the powdered clay in this manner, as for instance, on a pendent part, or on a stump, I then either suspend the part in a box filled with the powder, using the powder as Barton did the bran in his famous dressing, or envelop it completely with a thick layer of the powder on cotton wadding.

Where either of these expedients fail to effect a thorough and constant covering with the clay, I apply it as a paste all over the part, retaining this by Scultetus bandages, on which the paste has likewise been spread. The purpose of this layer of clay on the bandage is to make the bandage hold more firmly in its place, and to more thoroughly exclude the air. Over this Scultetus I apply the blue paper and roller as in the other dressing. The blue paper used by druggists to protect the saline part of the Seidlitz powders from the action of the air answers a most admirable purpose here.\* Recognizing as we do the disadvantage of the water

\* The influences of color were demonstrated by Franklin more than a hundred years ago, in relation to the conduction of heat. Priestley and In-

to the clay, we must feel the necessity of avoiding frequent renewals of the dressing greater here than where the dry powder has been used.

Where there is a necessity to keep the earth from drying, I always cover the dressing with waxed paper in preference to oil silk.\*

In applying the earth to the mucous membranes, as those of the nose, mouth, urethra, bladder, rectum, and vagina, there is of course no choice but to use it wet, in fact it can only be used in those instances *suspended* in water. The exception which may suggest itself, that of the vagina, to this rule is not a real one, for although the earth can be packed in that passage, it will not be tolerated there, according to my experience, by the patient for any length of time. The amount to be suspended in the water will depend on our means of application in each instance. As a mouth-wash it can be used much thicker than in any other instance. Thudiehum's bottle is the best way of using it on the nose, and answers most admirably with appropriate tubes for the rectum, vagina, urethra, and bladder, as by constantly agitating the bottle the earth can be kept well suspended. In gonorrhœa and cystitis I use always the double catheter devised by me some years ago, and figured in the Pennsylvania Hospital Reports for 1869, p. 256. I have had most ample proofs of the earth acting beneficially when applied in this way. In gonorrhœa, where my experience has been the most extensive, I have that confidence in this treatment that I always anticipate a cure, in the acute stage, within a week after the commencement with daily injections. The same results have been obtained by many professional friends, who have kindly communicated their experiences to me. My friend Dr. F. W. Godon, for-

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genous afterwards carefully studied them as regards their chemical actions in the development and growth of vegetable life. Then Bernard in France, and Samuelson in England, have more recently demonstrated the same in the growth of flies and other insects. And finally General Pleasanton, of Philadelphia, has quite lately shown the effects of color on the growth of animals, demonstrating most clearly the advantages of the blue tints of color over nutrition.

\* The advantages of the paper were predicted by the author in the Pennsylvania Hospital Reports for 1868, and have now caused it to entirely supersede the silk with a saving of several hundred dollars a year to the Institution.

merly of New York City, but now of San Francisco, in a recent letter to me says, "Since your high recommendation of it for the cure of gonorrhœa, I have been using it in all my cases, and I find that it proves itself almost a specific. I have collected now thirty-five cases where I have tried it in acute gonorrhœa, in all of which it has acted most satisfactorily; in no one of them has the disease lasted longer than a week after the earth had been used."

Such prompt relief is of course only to be looked for, as I have before intimated, in the acute stage of the morbid conditions for which I recommend the use of earth.

## A. II.



